Handbook of
Alternative Assets

Second Edition

MARK J. P. ANSON

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Handbook of Alternative Assets

Second Edition
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When my editor, Frank Fabozzi, suggested that it was time to write a new edition of The Handbook of Alternative Assets, I wondered: Has it really been that long since the first edition? Then, I realized that it had been four years since the first edition had been released. The intervening time period from 2002 to 2006 was one filled with different macroeconomic effects compared to the first edition of this book. Most of my data analysis in the first edition had been conducted during a period of robust economic growth—through calendar year 2000. However, the second edition allowed me to analyze the merits of alternative assets during a different part of the economic cycle. During this time period, a worldwide economic recession reigned from 2001 to 2002, the technology bubble burst, massive accounting scandals rocked the U.S. financial markets, and a three-year bear market depressed equity prices around the globe.

Furthermore, in those intervening four years there have been significant changes in the world of alternative assets, as inflows into alternative investments initially shrunk from 2001 to 2003 and then roared back to life in 2004 and 2005, leading to massive inflows into hedge funds, private equity, credit derivatives, corporate governance, and commodities. As a result, my exposure to, and my knowledge base associated with, alternative investments have increased significantly. Enough so that a second book on the subject was indeed timely.

So, for the reader, you will find that I wrote every chapter from a fresh start, with all new tables, charts, data analysis, equations, explanations and the like. New chapters were added, different data sources were accessed, and new conclusions were reached. The results of these efforts are reflected in the length of this book. At 700 pages, this book is more than 200 pages longer than the first edition. This reflects not only my effort to start anew on the subject but also the growth of the alternative asset universe.

As in the first edition, my goal is to educate the reader and not dazzle him or her with my grasp of technical and arcane alternative asset jargon. This book is designed both to introduce the reader to the alternative asset universe as well to be used as a reference for the active investor in alter-
native assets. To that effect the reader will find that some chapters are more descriptive in nature to provide introductory material while other chapters are more empirical in nature to provide concrete examples and conclusions about the risks and benefits of using alternative assets.

As before, I hope that this book will stimulate readers to think critically about alternative assets, to question my conclusions, and to pose questions of their own. If so, I will count this book as a great success.

Last, this book reflects my individual insights and opinions and not those of my current employers, the British Telecom Pension Scheme and Hermes Pensions Management Ltd., or my former employer, the California Public Employees’ Retirement System.
Mark Anson has the unusual role of being both the Chief Executive Officer of the British Telecommunications Pension Scheme (BTPS) as well as the Chief Executive Officer of Hermes Pensions Management Ltd. At over £34 billion (approximately $61 billion), the BTPS is the largest pension fund in the United Kingdom, and at £65 billion (approximately $117 billion) assets under management, Hermes is one of the largest asset managers in the City of London. By wearing two very different hats, Mark has the perspective of both an end user of investment products as well as a product developer for the asset management industry.

At BTPS, Mark has full authority for every asset class in which the pension fund invests, including domestic and international equity, net zero equity products, Gilts, inflation linked bonds, high-yield bonds, credit default swaps, CDOs, real estate, corporate governance, commodities, securities lending, venture capital, leveraged buyouts, and hedge funds. At Hermes, Mark oversees a staff of 300 with annual revenues of over £75 million.

As the Chief Investment Officer at CalPERS, Mark had full responsibility for all asset classes in which CalPERS invested as well as the strategic plan for CalPERS’ Investment Office including tactical asset allocation, risk management, business development, budget authority, new investment programs, trading technology, staffing, and back office operations. His responsibilities included an operating budget of $410 million and the generation of $7 billion in annual benefit payments. While at CalPERS, Mark oversaw the increase in fund value from $127 billion to $205 billion. In addition, he implemented the concept of separating beta from alpha and he was directly responsible for the generation of over $9 billion of excess returns.

Mark received a scholarship to attend the Northwestern University School of Law in Chicago where he received his law degree and graduated with honors as the Executive/Production Editor of the Northwestern University Law Review. Mark also received a scholarship to attend the Columbia University Graduate School of Business in New York City where he received both his Ph.D. and Masters in Finance, again with honors, as Beta Gamma Sigma. Mark graduated With Distinction from
St. Olaf College in Minnesota with a double major in Economics and Chemistry. Mark has also been honored with the Distinguished Scholar Award from the Institute of International Education and the Fulbright Foundation as well as the 2004 Best Paper award from the Journal of Portfolio Management.

Mark is a member of the New York and Illinois State Bar Associations. He has also earned the Chartered Financial Analyst, Chartered Alternative Investment Analyst, Certified Public Accountant, Certified Management Accountant, and Certified Internal Auditor professional degrees. Last, Mark has received the Series 3, 4, 7, 8, 24, and 63 NASD securities industry licenses.

In addition to the Handbook of Alternative Assets, Mark has published three other financial textbooks as well as over 80 research articles on the topics of separating beta from alpha, business models for the asset management industry, corporate governance, hedge funds, real estate, currency overlay, credit risk, private equity, risk management, and asset allocation. Mark is often the keynote speaker at investment conferences around the world on these topics. Furthermore, Mark sits on editorial and advisory boards for The Journal of Portfolio Management, The Journal of Alternative Investments, The Journal of Private Equity, The Journal of Investment Consulting, and The Journal of Derivatives Accounting.

PART One

Overview of Alternative Assets
What Is an Alternative Asset Class?

Part of the difficulty of working with alternative asset classes is defining them. Are they a separate asset class or a subset of an existing asset class? Do they hedge the investment opportunity set or expand it? Are they listed on an exchange or do they trade in the over the counter market?

In most cases, alternative assets are a subset of an existing asset class. This may run contrary to the popular view that alternative assets are separate asset classes. However, we take the view that what many consider separate “classes” are really just different investment strategies within an existing asset class.

In most cases, they expand the investment opportunity set, rather than hedge it. Finally, alternative assets are generally purchased in the private markets, outside of any exchange. While hedge funds, private equity, and credit derivatives meet these criteria, we will see that commodity futures prove to be the exception to these general rules.

Alternative assets, then, are just alternative investments within an existing asset class. Specifically, most alternative assets derive their value from either the debt or equity markets. For instance, most hedge fund strategies involve the purchase and sale of either equity or debt securities. Additionally, hedge fund managers may invest in derivative instruments whose value is derived from the equity or debt markets.

In this book, we classify five types of alternative assets: hedge funds, commodity and managed futures, private equity, credit derivatives, and corporate governance. Hedge funds and private equity are the best

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1 See, for example, Chapter 8 in David Swensen, *Pioneering Portfolio Management* (New York: The Free Press, 2000).
known of the alternative asset world. Typically these investments are accomplished through the purchase of limited partner units in a private limited partnership. Commodity futures can be either passive investing tied to a commodity futures index, or active investing through a commodity pool or advisory account. Private equity is the investment strategy of investing in companies before they issue their securities publicly, or taking a public company private. Credit derivatives can be purchased through limited partnership units, as a tranche of a special purpose vehicle, or directly through the purchase of credit default swaps or credit options. Corporate governance is also a form of shareholder activism designed to improve the internal controls of a public company.

We will explore each one of these alternative asset classes in detail, providing practical advice along with useful research. We begin this chapter with a review of super asset classes.

SUPER ASSET CLASSES

There are three super asset classes: capital assets, assets that are used as inputs to creating economic value, and assets that are a store of value.²

Capital Assets

Capital assets are defined by their claim on the future cash flows of an enterprise. They provide a source of ongoing value. As a result, capital assets may be valued based on the net present value of their expected returns.

Under the classic theory of Modigliani and Miller, a corporation cannot change its value (in the absence of tax benefits) by changing the method of its financing.³ Modigliani and Miller demonstrated that the value of the firm is dependent upon its cash flows. How those cash flows are divided up between shareholders and bondholders is irrelevant to firm value.

Capital assets, then, are distinguished not by their possession of physical assets, but rather, by their claim on the cash flows of an underlying enterprise. Hedge funds, private equity funds, credit derivatives, and corporate governance funds all fall within the super asset class of capital assets because the value of their funds are all determined by the present value of expected future cash flows from the securities in which they invest.

As a result, we can conclude that it is not the types of securities in which they invest that distinguishes hedge funds, private equity funds, credit derivatives, or corporate governance funds from traditional asset classes. Rather, it is the alternative investment strategies that they pursue that distinguishes them from traditional stock-and-bond investments.

**Assets that Can be Used as Economic Inputs**

Certain assets can be consumed as part of the production cycle. Consumable or transformable assets can be converted into another asset. Generally, this class of asset consists of the physical commodities: grains, metals, energy products, and livestock. These assets are used as economic inputs into the production cycle to produce other assets, such as automobiles, skyscrapers, new homes, and appliances.

These assets generally cannot be valued using a net present value analysis. For example, a pound of copper, by itself, does not yield an economic stream of revenues. Nor does it have much value for capital appreciation. However, the copper can be transformed into copper piping that is used in an office building, or as part of the circuitry of an electronic appliance.

While consumable assets cannot produce a stream of cash flows, we demonstrate in our section on commodities that this asset class has excellent diversification properties for an investment portfolio. In fact, the lack of dependency on future cash flows to generate value is one of the reasons why commodities have important diversification potential vis à vis capital assets.

**Assets that Are a Store of Value**

Art is considered the classic asset that stores value. It is not a capital asset because there are no cash flows associated with owning a painting or a sculpture. Consequently, art cannot be valued in a discounted cash flow analysis. It is also not an asset that is used as an economic input because it is a finished product.

Art requires ownership and possession. Its value can only be realized through its sale and transfer of possession. In the meantime, the owner retains the artwork with the expectation that it will yield a price at least equal to that which the owner paid for it.

There is no rational way to gauge whether the price of art will increase or decrease because its value is derived purely from the subjective (and private) visual enjoyment that the right of ownership conveys. Therefore, to an owner, art is a store of value. It conveys neither economic benefits nor is used as an economic input, but retains the value paid for it.

Gold and precious metals are another example of a store of value asset. In the emerging parts of the world, gold and silver are a signifi-
cant means of maintaining wealth. In these countries, residents do not have access to the same range of financial products that are available to residents of more developed nations. Consequently, they accumulate their wealth through a tangible asset as opposed to a capital asset.

However, the lines between the three super classes of assets can become blurred. For example, gold can be leased to jewelry and other metal manufacturers. Jewelry makers lease gold during periods of seasonal demand, expecting to purchase the gold on the open market and return it to the lessor before the lease term ends. The gold lease provides a stream of cash flows that can be valued using net present value analysis. In May 2006, at a lease rate of 1.5% and a gold price of $700/ounce, the lease rate was only $10.5.

Precious metals can also be used as a transformable/consumable asset because they have the highest level of thermal and electrical conductivity among the metals. Silver, for example, is used in the circuitry for most telephones and light switches. Gold is used in the circuitry for TVs, cars, airplanes, computers, and rocketships.

Real Estate
We provide a brief digression to consider where real estate belongs in our classification scheme. Real estate is a distinct asset class, but is it an alternative one? For purposes of this book, we do not consider real estate to be an alternative asset class. The reasons are several.

First, real estate was an asset class long before stocks and bonds became the investment of choice. In fact, in times past, land was the single most important asset class. Kings, queens, lords and nobles measured their wealth by the amount of property that they owned. “Land barons” were aptly named. Ownership of land was reserved only for the most wealthy of society.

However, over the past 200 years, our economic society changed from one based on the ownership of property to the ownership of legal entities. This transformation occurred as society moved from the agricultural age to the industrial age. Production of goods and services became the new source of wealth and power.

Stocks and bonds were born to support the financing needs of new enterprises that manufactured material goods and services. In fact, stocks and bonds became the “alternatives” to real estate instead of vice versa. With the advent of stock-and-bond exchanges, and the general acceptance of owning equity or debt stakes in companies, it is sometimes forgotten that real estate was the original and primary asset class of society.

In fact, it was only 25 years ago in the United States that real estate was the major asset class of most individual investors. This exposure
What Is an Alternative Asset Class?

was the result of owning a primary residence. It was not until the long bull market started in 1983 that investors began to diversify their wealth into the “alternative” assets of stocks and bonds.

Second, given the long-term presence of real estate as an asset class, several treatises have been written concerning its valuation. These treatises provide a much more extensive examination of the real estate market than can be covered within the scope of this book.

Finally, we do not consider real estate to be an alternative asset class as much as we consider it to be an additional asset class. Real estate is not an alternative to stocks and bonds—it is a fundamental asset class that should be included within every diversified portfolio. The alternative assets that we consider in this book are meant to diversify the stock-and-bond holdings within a portfolio context.

**ASSET ALLOCATION**

Asset allocation is generally defined as the allocation of an investor’s portfolio across a number of asset classes. Asset allocation, by its very nature shifts the emphasis from the security level to the portfolio level. It is an investment profile that provides a framework for constructing a portfolio based on measures of risk and return. In this sense, asset allocation can trace its roots to Modern Portfolio Theory and the work of Harry Markowitz.

**Asset Classes and Asset Allocation**

Initially, asset allocation involved four asset classes: equity, fixed income, cash, and real estate. Within each class, the assets could be further divided into subclasses. For example, stocks can be divided into large capitalized stocks, small-capitalized stocks, and foreign stocks. Similarly,

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fixed income can be broken down into U.S. Treasury notes and bonds, investment-grade bonds, high-yield bonds, and sovereign bonds.

The expansion of newly defined “alternative assets” may cause investors to become confused about their diversification properties and how they fit into an overall diversified portfolio. Investors need to understand the background of asset allocation as a concept for improving return while reducing risk.

For example, in the 1980s the biggest private equity game was taking public companies private. Does the fact that a corporation that once had publicly traded stock but now has privately traded stock mean that it has jumped into a new asset class? Furthermore, public offerings are the primary exit strategy for private equity; public ownership begins where private equity ends. Therefore, it might be argued that private equity is just an extension of the equity markets where the dividing boundary is based on liquidity.

Similarly, credit derivatives expand the fixed income asset class, rather than hedge it. Hedge funds also invest in the stock-and-bond markets but pursue trading strategies very different from a traditional buy and hold strategy. Commodities fall into a different class of assets than equity, fixed income or cash, and will be treated separately in this book.

Last, corporate governance is a strategy for investing in public companies. It seems the least likely to be an alternative investment strategy. However, we will demonstrate that a corporate governance program bears many of the same characteristics as other alternative investment strategies.

**Strategic versus Tactical Allocations**

Alternative assets should be used in a tactical rather than strategic allocation. Strategic allocation of resources is applied to fundamental asset classes such as equity, fixed income, cash, and real estate. These are the basic asset classes that must be held within a diversified portfolio.

Strategic asset allocation is concerned with the long-term asset mix. The strategic mix of assets is designed to accomplish a long-term goal such as funding pension benefits or matching long-term liabilities. Risk aversion is considered when deciding the strategic asset allocation, but current market conditions are not. In general, policy targets are set for strategic asset classes with allowable ranges around those targets. Allowable ranges are established to allow flexibility in the management of the investment portfolio.

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Tactical asset allocation is short-term in nature. This strategy is used to take advantage of current market conditions that may be more favorable to one asset class over another. The goal of funding long-term liabilities has been satisfied by the target ranges established by the strategic asset allocation. The goal of tactical asset allocation is to maximize return.

Tactical allocation of resources depends on the ability to diversify within an asset class. This is where alternative assets have the greatest ability to add value. Their purpose is not to hedge the fundamental asset classes, but rather to expand them. Consequently, alternative assets should be considered as part of a broader asset class.

An example is credit derivatives. These are investments that expand the frontier of credit risk investing. The fixed income world can be classified simply as a choice between U.S. Treasury securities that are considered to be default free, and spread products that contain an element of default risk. Spread products include any fixed income investment that does not have a credit rating on par with the U.S. government. Consequently, spread products trade at a credit spread relative to U.S. Treasury securities that reflects their risk of default.

Credit derivatives are a way to diversify and expand the universe for investing in spread products. Traditionally, fixed income managers attempted to establish their ideal credit risk and return profile by buying and selling traditional bonds. However, the bond market can be inefficient and it may be difficult to pinpoint the exact credit profile to match the risk profile of the investor. Credit derivatives can help to plug the gaps in a fixed income portfolio, and expand the fixed income universe by accessing credit exposure in more efficient formats.

**Efficient versus Inefficient Asset Classes**

Another way to distinguish alternative asset classes is based on the efficiency of the market place. The U.S. public stock-and-bond markets are generally considered to be the most efficient marketplaces in the world. Often, these markets are referred to as “Semi-Strong Efficient.” This means that all publicly available information regarding a publicly traded corporation, both past information and present, is fully digested in that company’s traded securities.

Yet inefficiencies exist in all markets, both public and private. If there were no informational inefficiencies in the public equity market, there would be no case for active management. Nonetheless, whatever inefficiencies do exist, they are small and fleeting. The reason is that information is easy to acquire and disseminate in the publicly traded securities markets. Top quartile active managers in the public equity market earn excess returns (over their benchmarks) of approximately 1% a year.
In contrast, with respect to alternative assets, information is very difficult to acquire. Most alternative assets (with the exception of commodities) are privately traded. This includes private equity, hedge funds, and credit derivatives. The difference between top quartile and bottom quartile performance in private equity can be as much as 25%.

Consider venture capital, one subset of the private equity market. Investments in startup companies require intense research into the product niche the company intends to fulfill, the background of the management of the company, projections about future cash flows, exit strategies, potential competition, beta testing schedules, and so forth. This information is not readily available to the investing public. It is time consuming and expensive to accumulate. Furthermore, most investors do not have the time or the talent to acquire and filter through the rough data regarding a private company. One reason why alternative asset managers charge large management and incentive fees is to recoup the cost of information collection.

This leads to another distinguishing factor between alternative investments and the traditional asset classes: the investment intermediary. Continuing with our venture capital example, most investments in venture capital are made through limited partnerships, limited liability companies, or special purpose vehicles. It is estimated that 80% of all private equity investments in the United States are funneled through a financial intermediary.

Investments in alternative assets are less liquid than their public markets counterparts. Investments are closely held and liquidity is minimal. Furthermore, without a publicly traded security, the value of private securities cannot be determined by market trading. The value of the private securities must be estimated by book value, appraisal, or determined by a cash flow model.

**Constrained versus Unconstrained Investing**

During the great bull market from 1981 to 2000 the asset management industry only had to invest in the stock market to enjoy consistent, high, double-digit returns. During this heyday, investment management shops and institutional investors divided their assets between the traditional asset classes of stocks and bonds. As the markets turned sour at the beginning of the new millennium, asset management firms and institutional investors found themselves “boxed in” by these traditional asset class distinctions. They found that their investment teams were organized along traditional asset class lines and their investment portfolios were constrained by efficient benchmarks that reflected this “asset box” approach.
Consequently, traditional asset management shops have been slow to reorganize their investment structures. This has allowed hedge funds and other alternative investment vehicles to flourish because they are not bounded by traditional asset class lines—they can invest outside the benchmark. These alternative assets are free to exploit the investment opportunities that fall in between the traditional benchmark boxes. The lack of constraints allows alternative asset managers a degree of freedom that is not allowed the traditional asset class shops. Furthermore, traditional asset management shops remain caught up in an organizational structure that is bounded by traditional asset class lines. This provides another constraint because it inhibits the flow of information and investment ideas across the organization.

**Asset Location versus Trading Strategy**

One of the first and best papers on hedge funds by William Fung and David Hsieh show a distinct difference between how mutual funds and hedge funds operate. They show that the economic exposure associated with mutual funds is defined primarily by *where* the mutual fund invests. In other words, mutual funds gain their primary economic and risk exposures by the location of the asset classes in which they invest. Thus we get large-cap active equity funds, small-cap growth funds, Treasury bond funds, and the like.

Conversely, Fung and Hsieh show that hedge funds’ economic exposures are defined more by *how* they trade. That is, a hedge fund’s risk and return exposure is defined more by a trading strategy within an asset class than it is defined by the location of the asset class. As a result, hedge fund managers tend to have much greater turnover in their portfolios than mutual funds.

**Asset Class Risk Premiums versus Trading Strategy Risk Premiums**

Related to the idea of trading strategy versus investment location is the notion of risk premiums. You cannot earn a return without incurring risk. Traditional investment managers earn risk premiums for investing in the large-cap value equity market, small-cap growth equity market, high-yield bond market; in other words, based on the location of the asset markets in which they invest.

Conversely, alternative asset managers also earn returns for taking risk, but the risk is defined more by a trading strategy than it is an economic exposure associated with the systematic risk contained within broad financial classes. For example, hedge fund strategies such as con-
vertible arbitrage, statistical arbitrage, and equity market neutral can earn a “complexity” risk premium.\(^8\)

These strategies buy and sell similar securities expecting the securities to converge in value overtime. The complexity of implementing these strategies results in inefficient pricing in the market. Additionally, many investors are constrained by the long-only constraint—their inability to short securities. This perpetuates inefficient pricing in the marketplace which enables hedge funds to earn a return.

**OVERVIEW OF THIS BOOK**

This book is organized into six parts. The first part provides a framework to consider alternative assets within a broader portfolio context. Specifically, in Chapter 2 we expand on the concept of strategic versus tactical asset allocation and the use of beta drivers versus alpha drivers to achieve these goals.

The second part of this book reviews hedge funds. Chapter 3 begins with a brief history on the birth of hedge funds and an introduction to the types of hedge fund investment strategies. Chapter 4 provides some practical guidance as to how to build a hedge fund investment program. Chapter 5 is devoted to conducting due diligence, including both a qualitative and quantitative review. In Chapter 6 we analyze the return distributions hedge funds and begin to consider some risk management issues. In Chapter 7 we expand the discussion of hedge fund risks and highlight some specific examples of hedge fund underperformance. In Chapter 8 we review the regulatory framework in which hedge funds operate. Chapter 9 provides an introduction to hedge fund benchmarks and how these benchmarks can impact the asset allocation decision to hedge funds. In Chapter 10, we consider the fees charged by hedge fund managers—a key point of contention between hedge fund managers and their clients. Last, in Chapter 11 we conclude on a humorous note as we go through a top ten list of hedge fund quotes and accompanying anecdotes.

Part Three is devoted to commodity and managed futures. We begin with a brief review in Chapter 12 of the economic value inherent in commodity futures contracts. Chapter 13 describes how an individual or institution may invest in commodity futures, including an introduction to commodity future benchmarks. Chapter 14 considers commodity futures within a portfolio framework, while Chapter 15 examines the managed futures industry.

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Part Four covers the spectrum of private equity. In Chapter 16 we provide an introduction to venture capital, while Chapter 17 is devoted to leveraged buyouts. In Chapters 18 and 19 we show how two different forms of debt may be a component of the private equity marketplace. In Chapter 20 we review the economics associated with private equity investments, and in Chapter 21 we consider some issues with respect to private equity benchmarks. In Chapter 22, we review some new trends in the private equity marketplace.

Part Five is devoted to credit derivatives. In Chapter 23 we review the importance of credit risk, and provide examples of how credit derivatives are used in portfolio management. In Chapter 24 we review the collateralized debt obligation market. Specifically, we review the design, structure and economics of collateralized bond obligations and collateralized loan obligations. In Chapter 25 we consider a new form of asset backed security—the collateralized fund obligation.

Finally, we devote Chapter 26 to corporate governance as an alternative investment strategy.

Throughout this book we attempt to provide descriptive material as well as empirical examples. In each chapter you will find charts, tables, graphs, and calculations that serve to highlight a specific point. Our goal is both to educate the reader with respect to these alternative investment strategies as well as provide a reference book for data and research. Along the way we also try to provide a few anecdotes about alternative investing that, while providing some humor, also demonstrate some of the pitfalls of the alternative asset universe.
Why Alternative Assets are Important: Beta Drivers and Alpha Drivers

The 1980s and 1990s experienced an unprecedented equity market expansion that provided an average annual total return to the S&P 500 of over 17% per year. It was hard to ignore the premium that the equity market delivered over U.S. Treasury Bonds during this time. Over the same time period the average total return for the 10-year U.S. Treasury Bond was 9.83%, and even that was an historically high number.

The long-term implied equity risk premium (over 10-year U.S. Treasury Bonds) has been estimated at 3.8%. This is the risk premium implied by stock market valuations and forecasts of earnings in relation to current market value. Another way to state this is that it is the expected risk premium that a long-term investor must earn to entice her to hold equities over government bonds. However, throughout the

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1 See Henry Dickson and Charles Reinhard, “Weekly Earnings Comment,” Lehman Brothers Research, July 21, 2004. The long-term ERP is measured for U.S. stocks, but the risk premium is remarkably consistent across international borders. Of interest, there are two time periods when the equity risk premium approached zero. The first was in the autumn of 1987, before the stock market undertook a massive correction in October of 1987. At that time, portfolio insurance was all the rage. Of course, this turned out to be a fallacy, but at the time, the ERP was driven close to zero because investors believed that they could “insure” against losses so that investing in the stock market was associated with a zero-risk premium. The second time was at the height of the tech bubble. Then, investors so overvalued stocks based on the technology hype that the ERP also approached zero.
1980s and 1990s, the realized risk premium frequently exceeded that implied by investors' expectations.

Exhibit 2.1 plots the realized equity risk premium compared to the long-term expected risk premium. It also graphs the cumulative equity risk premium earned over this period. Initially, in the early to mid 1980s, the realized equity risk premium was inconsistent—sometimes greater than the expected long-term risk premium, sometimes less. However, from the late 1980s through the end of the 1990s, the realized risk premium for holding equities consistently exceeded the expected premium. Investors were continually rewarded with equity market returns that exceeded their expectations.

This led large institutional investors to rely exclusively on asset allocation models where asset classes were defined by strict lines or “benchmark boxes.” For 20 years, this type of investing worked for large institutional investors. However, the global bear equity market of 2000 to 2002 demonstrated that mean reversion is a powerful force in finance.

**EXHIBIT 2.1** Expected and Realized Equity Risk Premium

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